REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of April 13, 2007 is respectfully requested.

By this Amendment, claims 15, 16 and 18-24 have been cancelled, and new claims 25-37 have been added and are currently pending in the application. No new matter has been added by these amendments.

Applicants would like to thank the Examiner for her courtesy in granting and conducting the personal interview of May 10, 2007, during which the claim rejections under 35 U.S.C. § 112, first and second paragraphs, were discussed. Specific portions of the interview will be referred to in the following discussion.

On page 3 of the Office Action, the Examiner rejected claims 15, 16 and 18-24 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In the interview of May 10, 2007, the Examiner indicated that, according to the Examiner's interpretation, claim 15 requires that the switching device be located on the plate. The Examiner further indicated that the interpretation of the switching device being required to be located on the plate is due to the broad interpretation of the phrase "switching a connection," as recited in claim 15.

In this regard, it is noted that independent claim 15 has been cancelled, and new independent claims 25-28 have been added. In order to address the Examiner's rejection under 35 U.S.C. § 112, first paragraph based on the phrase "switching a connection," it is also noted that new independent claims 25-28 do not include the phrase "switching a connection." Rather, the switching devices are recited as being for "switching the flow of gas" (claims 25 and 26) or for "controlling a flow of gas" (claims 27 and 28). Therefore, it is respectfully submitted that new independent claims 25-28 do not in any way require that the switching device be located on the plate.

In addition, it is noted that new independent claim 26 recites that the switching devices are arranged outside of the cell. Further, it is noted that independent claims 25-28 are fully supported by the specification, as explained in paragraphs [0030]-[0033] and as shown in Figs. 1-4, 6 and 7. Therefore, it is respectfully submitted that the Examiner's rejection under § 112, first paragraph, is not applicable to the new claims.

On page 4 of the Office Action, the Examiner rejected claims 15, 16 and 18-24 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner asserted that the phrase "switching a connection" is unclear because the switching devices of the present invention do not appear to switch the structural connection between the first and second gas flow channels. In this regard, as stated above, it is noted that claims 15, 16 and 18-24 have been cancelled and replaced by new claims 25-37. It is also noted that new independent claims 25-28 do not include the phrase "switching a connection." Rather, the switching devices are recited as being for "switching the flow of gas" (claims 25 and 26) or for "controlling a flow of gas" (claims 27 and 28). Therefore, it is respectfully submitted that the Examiner's formal rejections under § 112, second paragraph, are not applicable to the new claims.

On page 5 of the Office Action, the Examiner rejected claims 15, 16 and 18-24 under 35 U.S.C. § 102(e) as being anticipated by McElroy (US 6,251,534). On pages 5-6 of the Office Action, the Examiner rejected claims 15 and 22-24 under 35 U.S.C. § 102(e) as being anticipated by Skala et al. (US 6,911,277). However, as indicated above, claims 15, 16 and 18-24 have been cancelled and replaced with new claims 25-37. For the reasons discussed below, it is respectfully submitted that the new claims are clearly patentable over the prior art of record.

New independent claim 25 recites a fuel cell which includes a cell having a gas flow plate. Claim 25 also recites that a first gas flow channel and a second gas flow channel are both provided in the gas flow plate such that a flow of gas along the gas flow plate is able to flow in a series flow from one of the first and second gas flow channels to the other of the first and second gas flow channels, and in a parallel flow along both of the first and second gas flow channels. The fuel cell of claim 25 also includes switching devices for switching the flow of gas from the parallel flow to the series flow, and from the series flow to the parallel flow.

New independent claim 26 recites a fuel cell which includes a cell having a gas flow plate. Claim 26 also recites that a first gas flow channel and a second gas flow channel are both provided in the gas flow plate such that a flow of gas along the gas flow plate is able to flow in a series flow from one of the first and second gas flow channels to the other of the first and second gas flow channels, and in a parallel flow along both of the first and second gas flow channels. The fuel cell of claim 26 also includes switching devices for switching the flow of gas from the parallel flow to the series flow, and from the series flow to the parallel flow. Claim 26 also recites that the switching devices are arranged outside of the cell.

New independent claim 27 recites a fuel cell system comprising a cell having a gas flow plate. Claim 27 also recites a first gas flow channel and a second gas flow channel both provided in the gas flow plate, with the first gas flow channel extending from a first manifold to a second manifold, and with the second gas flow channel extending from the second manifold to a third manifold. The fuel cell system of claim 27 also includes switching devices for controlling a flow of gas through at least one of the first, second and third manifolds so as to switch a flow of gas along the first and second gas flow channels from a parallel flow to a series flow, and from a series flow to a parallel flow.

New independent claim 28 recites a fuel cell system comprising a cell having a gas flow plate. Claim 28 also recites a first gas flow channel and a second gas flow channel both provided in the gas flow plate, with the first gas flow channel extending from a first manifold to a second manifold, the second gas flow channel extending from a third manifold to a fourth manifold, and with the second manifold and the third manifold being connected by a gas flow path. Claim 28 further recites switching devices for controlling a flow of gas between the second manifold and the third manifold so as to switch a flow of gas along the first and second gas flow channels from a parallel flow to a series flow, and from a series flow to a parallel flow.

McElroy discloses a fuel cell cascade flow system which, as shown in Fig. 1, includes a fuel cell stack 200 and a fuel cell stack 300 separated by a partition 110. Each fuel cell stack 200, 300 includes a plurality of fuel cells 150, and each fuel cell includes an anode flow field plate 220 and a cathode flow field plate 210. The anode flow field plate 220 has channels 226

(as shown in Fig. 3) and the cathode flow field plate 210 has channels 216 (as shown in Fig. 4). Fuel cell stack 200 has an inlet 280 and an outlet 290, and fuel cell stack 300 has ports 310, 320 and 330.

However, McElroy does not disclose *a first gas flow channel and a second gas flow channel both provided in the gas flow plate, and switching devices for switching the flow of gas from a parallel flow (in which the gas flows along both of the first and second gas flow channels) to a series flow (in which the gas flows from one of the first and second gas flow channels to the other of the first and second gas flow channels), and from the series flow to the parallel flow*, as required by new independent claims 25 and 26.

In particular, McElroy only discloses a gas flow plate (*e.g.*, anode flow field plate 220, as shown in Fig. 3) having flow channels 226, and does not disclose that the flow channels 226 include first and second gas flow channels provided such that gas is able to flow in a series flow *from one of the first and second gas flow channels to the other of the first and second gas flow channels*, and in a parallel flow *along both of the first and second gas flow channels*. McElroy also does not disclose switching devices for switching the flow of gas from the parallel flow to the series flow, and from the series flow to the parallel flow.

Further, McElroy only discloses a series of valves 500, 510, 520 which switch the flow of gas between separate stacks of fuel cells from a series flow to a parallel flow. McElroy discloses at column 6, lines 8-24, that during low power output conditions, the valves 500, 510, 520 are set such that gas flows through the fuel cell stack 200 and then enters fuel cell stack 300 after leaving the fuel cell stack 200 (*i.e.*, gas flows through fuel cell stacks 200, 300 in series). McElroy also discloses at column 6, lines 28-41, that during high power output conditions, the valves are set such that gas flows through fuel cell stack 200 and, at the same time, gas flows through fuel cell stack 300 from port 310 (*i.e.*, gas flows through fuel cell stacks 200, 300 in parallel). Therefore, McElroy does not disclose switching devices for switching the flow of gas along first and second gas flow channels, both of which are provided within the same plate, from the parallel flow to the series flow and from the series flow to the parallel flow because McElroy only discloses switching the flow of gas between separate stacks of fuel cells.

McElroy also does not disclose a first gas flow channel and a second gas flow channel both provided in the gas flow plate, with the first gas flow channel extending *from a first manifold to a second manifold*, and with the second gas flow channel extending *from the second manifold to a third manifold* (as required by new independent claim 27) *or from a third manifold to a fourth manifold* (as required by new independent claim 28). Rather, as shown in Figs. 3, 4 and 6, McElroy discloses that all the flow channels on the plate extend between the same two manifolds, and therefore McElroy does not disclose that the plate includes a second gas flow channel that extends from the second manifold to a third manifold (claim 27) or from a third manifold to a fourth manifold (claim 28).

Further, for reasons similar to those stated above, McElroy does not disclose switching devices for controlling a flow of gas through the manifolds *so as to switch a flow of gas along the first and second gas flow channels from a parallel flow to a series flow, and from a series flow to a parallel flow*, as required by independent claims 27 and 28. In particular, McElroy does not disclose switching devices for controlling a flow of gas through the manifolds so as to switch a flow of gas along first and second gas flow channels, both of which are provided in the same plate, from the parallel flow to the series flow and from the series flow to the parallel flow because McElroy only discloses switching the flow of gas between separate stacks of fuel cells

Skala discloses a fuel cell which, as shown in Figs. 2-7, includes a fuel cell stack 30 having manifolds 36, 38 on opposite sides of the fuel cells 20. The manifolds 36, 38 include rotary sector valves 40, 42 which are rotated through four positions (as shown in Figs. 2-5) so as to alter the flow of gas through the fuel cell stack 30.

However, Skala does not disclose *a first gas flow channel and a second gas flow channel both provided in the gas flow plate, and switching devices for switching the flow of gas from a parallel flow (in which the gas flows along both of the first and second gas flow channels) to a series flow (in which the gas flows from one of the first and second gas flow channels to the other of the first and second gas flow channels), and from the series flow to the parallel flow*, as required by new independent claims 25 and 26.

In particular, Skala only discloses that bipolar plates 22 define *passages* for the gas to be

distributed to the anode and cathode layers, and does not disclose that the passages include first and second gas flow channels provided in the same plate such that gas is able to flow in a series flow *from one of the first and second gas flow channels to the other of the first and second gas flow channels*, and in a parallel flow *along both of the first and second gas flow channels.*

Further, Skala only discloses that the rotary sector valves 40, 42 are rotated to alter to flow of gas through the fuel cell stack (*i.e.*, through a plurality of fuel cells). Therefore, Skala does not disclose switching devices for switching the flow of gas along first and second gas flow channels, both of which are provided within the same plate, from the parallel flow to the series flow and from the series flow to the parallel flow because Skala only discloses switching the flow of gas through the fuel cell stack.

Further, for reasons similar to those stated above, Skala does not disclose switching devices for controlling a flow of gas through the manifolds *so as to switch a flow of gas along the first and second gas flow channels from a parallel flow to a series flow, and from a series flow to a parallel flow*, as required by independent claims 27 and 28. In particular, Skala does not disclose switching devices for controlling a flow of gas through the manifolds so as to switch a flow of gas along first and second gas flow channels, both of which are provided in the same plate, from the parallel flow to the series flow and from the series flow to the parallel flow because Skala only discloses switching the flow of gas through the fuel cell stack.

Therefore, it is respectfully submitted that new independent claims 25-28, as well as claims 29-37 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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